

# Land-Use Footprint of Future Electricity Production in Ireland: Three Scenarios

The footprint of electricity production in Ireland, i.e. the amount of land that is needed to produce electricity, is low at present for three main reasons:



We import almost half of the fuels need to produce our electricity, so the production footprint is in other countries



Renewables only account for about 16% of Ireland's electricity generation



Approximately 30% of the total fuel needed to produce our electricity comes from two small Irish offshore natural gas fields

As we transition to lower carbon energy sources, most of which will be located in Ireland, one of the key issues is the amount of land that would be needed for this purpose.

## What can be used to produce electricity in Ireland?



Ireland has no proven economic reserves of **coal** or **oil**, and although the discovery of offshore oil remains a possibility these higher carbon energy sources are not an option for domestic production at present.



Ireland has made a policy decision not to develop **nuclear energy**.



Ireland's three **peat** powered electricity plants have already announced that by 2030 they will be not use peat to produce electricity.



**Biomass** is likely to play an important part in Ireland's electricity future but there are too many uncertainties to be able to predict the likely land footprint of producing biomass.



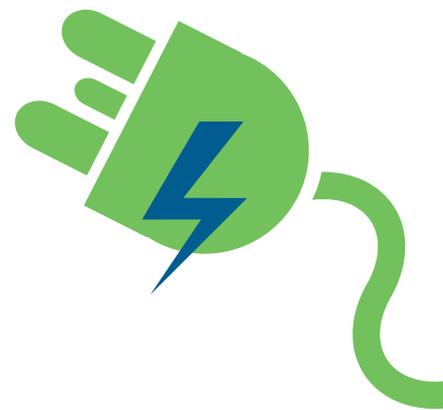
**Natural gas** is a potential source. All of Ireland's natural gas production is offshore.



**Wind** is likely to provide significant energy. Wind farms could be located onshore or offshore.



**Solar** energy is another option that is currently being developed and will primarily be onshore.



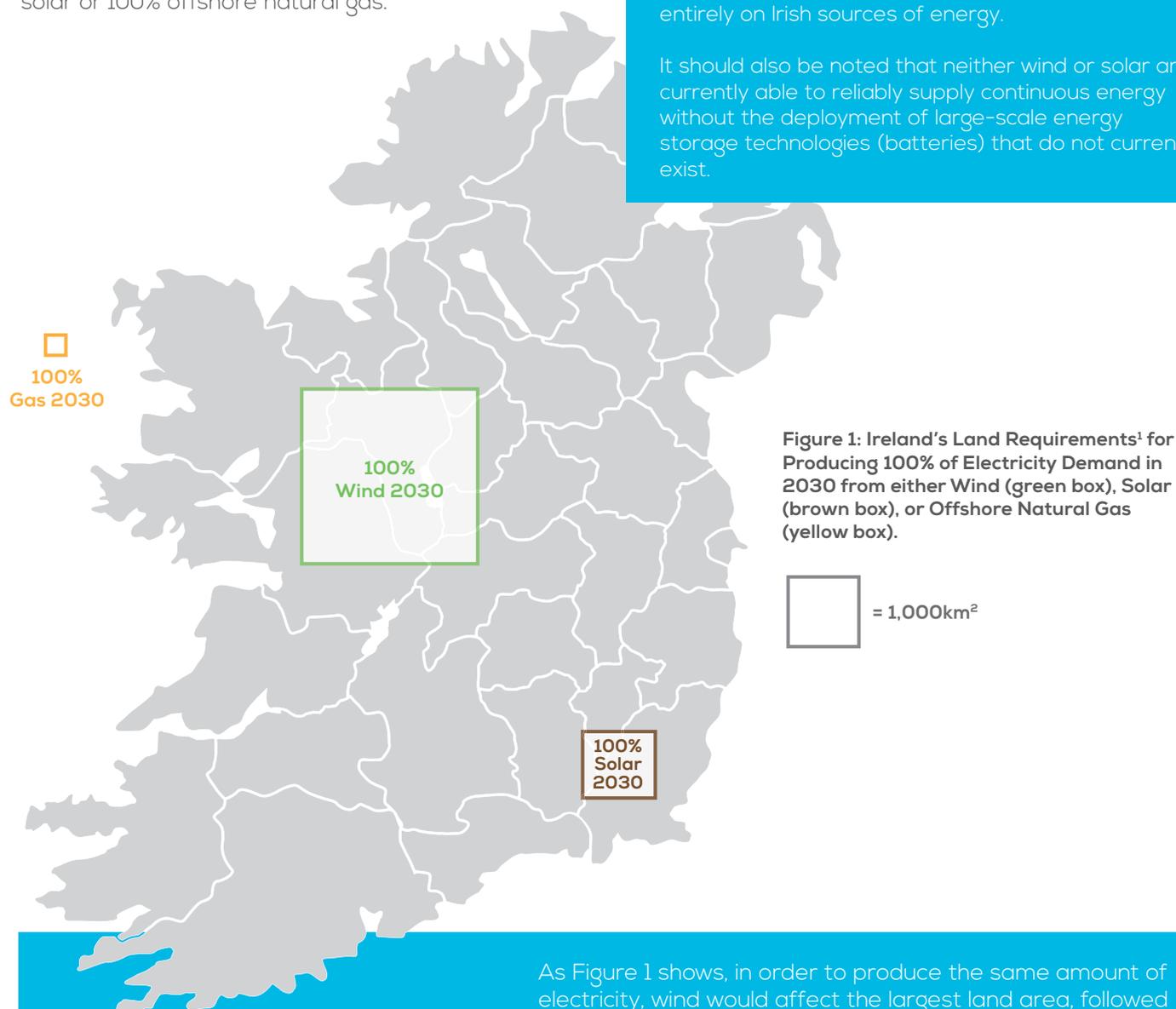
## How much land would be affected if we were to produce all our electricity from domestic sources in 2030?

Here we consider the land-use impact if Ireland met all of the predicted electricity demand in 2030 entirely from one of three potential domestic sources.

Figure 1 shows the approximate land area that would be required to produce all of Ireland's electricity in 2030 from 100% wind or 100% solar or 100% offshore natural gas.

We apply three end-member scenarios to the electricity sector to highlight the potential impact of each of the three energy sources. While these scenarios do not include the transportation and heating sectors, they do include the increase in electricity demand due to the electrification of these sectors. However, they are estimated to still require significant imports of oil to meet their predicted demand in 2030 and therefore cannot currently rely entirely on Irish sources of energy.

It should also be noted that neither wind or solar are currently able to reliably supply continuous energy without the deployment of large-scale energy storage technologies (batteries) that do not currently exist.



As Figure 1 shows, in order to produce the same amount of electricity, wind would affect the largest land area, followed by solar power, and then natural gas.

### Sources:

EirGrid's Steady Evolution Scenario, 2030 provides total installed electricity capacity by energy source which is converted using load factors from [EirGrid Capacity Statement 2017-30](#) and [SEAI Energy in Ireland 1990-2015](#) to estimate total installed capacity for 100% of each energy source. Land use is then estimated using [SEAI](#) figure of 5 acres per MW of installed capacity for solar and [MacKay's](#) estimate of 2.5 MW/km<sup>2</sup> for wind. As according to [Gas Networks Ireland](#) the Corrib Gas Field currently provides 49% of Ireland's gas needs, this figure is used to estimate the number of similar sized fields required to supply 100% of Ireland's electricity demand via gas.